Gun-shot wound of the face (Case P36)

DR. HUBBARD: This 52-year-old man was brought to Casualty by police ambulance, with a gun-shot wound under the jaw. He was agitated but appeared to be well orientated. He had been admitted to hospital once before for a suicide attempt (an overdose of pills) and was a confirmed heavy drinker. On the day of admission he apparently had been drinking and became depressed. He directed a revolver under the right side of his chin and pulled the trigger. At the time we were not sure what calibre of weapon was used. His wife stated that the bullet was one from a package which had been stored in the basement and was in quite a damp condition. The entry wound was on the under side of his jaw, but as there was no exit wound and no evidence of a metallic object on the x-rays we assumed that the bullet had emerged through his open mouth. He was bleeding from the mouth, and the alveolar ridge of the right mandible was shattered. There were numerous bone fragments in the mucosal membrane and lacerations along the right side of the tongue. His blood pressure was 98/50 and the pulse rate was about 90. Numerous rales and rhonchi were audible in his chest. He was admitted and taken to the operating room; his postoperative course has been uneventful.

DR. DESAULNIERS: The anteroposterior, lateral and oblique views of the mandible demonstrate a severely comminuted, grossly displaced fracture of the body of the right hemimandible. A circular metal marker has been placed on the skin at the site of the entry wound (Fig. 1). No metallic fragments or other foreign material is seen. There is soft tissue swelling in the mouth and neck, but the hypopharyngeal and laryngeal airway is not compromised.

DR. SCHWARTZ: The shell brought in by the police was reported as .32 calibre and was assumed to be a blank. On examination the right side of the mandible was very unstable and felt like a bag of marbles. The alveolar nerve looked like a clothes line with several bony fragments hanging from it, but it was intact, although slightly edematous at various points. The portion of the mandible that was fractured extended from just in front of the angle up to and including the mental foramen. At operation, total debridement was carried out, including removal of all bony fragments, and immobilization was effected with an external Clouston-Walker splint. This splint is held in place by two screws in the mandible reaching just beyond the inner cortex. The patient can talk normally and move his jaw very well. During the first few days, because he ate and drank rather poorly, he was maintained on intravenous therapy. He has been running a low-grade fever which may be explained by his chest condition. He has multiple lacerations on the side of the tongue and of the oral mucosa as well. He has been kept under heavy sedation because of his psychological condition.

DR. WOOLHOUSE: We are showing this patient for two reasons. One is the mode of injury, a gun-shot wound with a blank cartridge, and the other is the use of external skeletal fixation. This device was introduced about the time of World War II by a veterinarian to treat the broken legs of race horses. We formerly used it to treat long bone fractures and it persisted as an orthodox type of treatment of fractured jaws for a short while, but the complication rate was high. It caused a low-grade soft tissue infection with occasional ring sequestra in the bone, so it fell into complete disuse as a method of treating the usual mandibular fractures. However, one or two indications for its use still remain. One is for an untidy,

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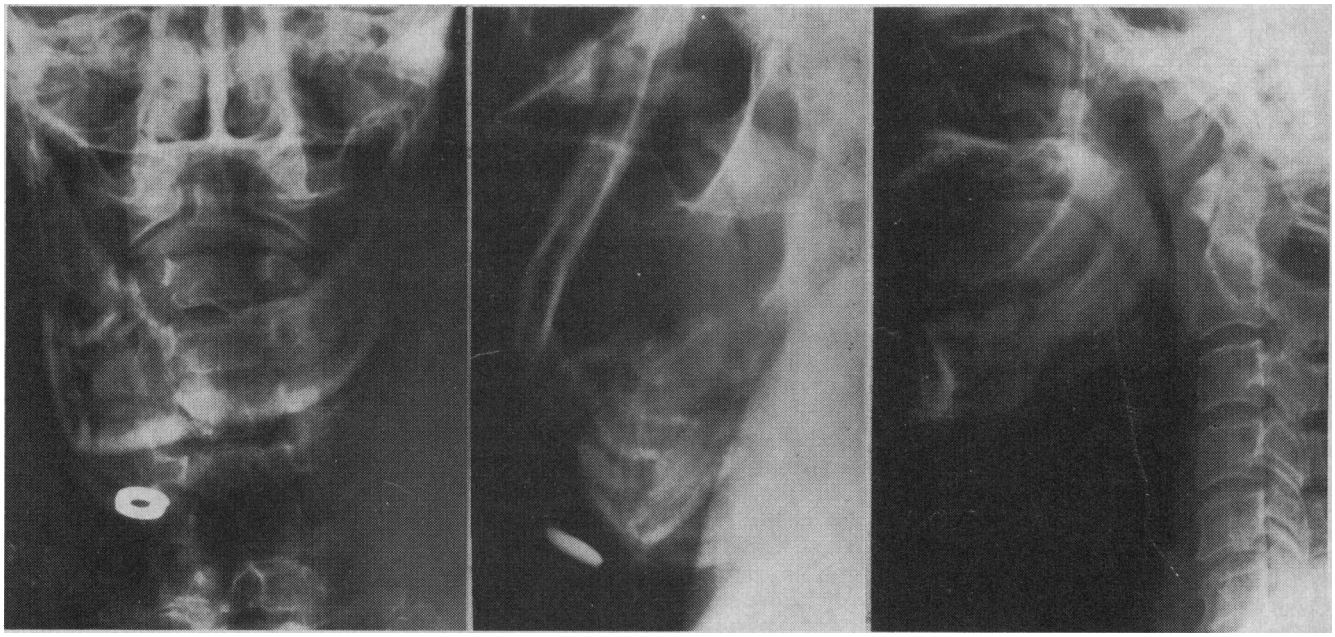

FIG. 1—Anteroposterior, oblique and lateral films of mandible demonstrating severely comminuted and displaced fracture of right hemimandible. Note marker at entry wound on skin.

contused wound such as the present one in which there is bone deficit and no immediate replacement can be done where one wants to get primary healing and to maintain the space. (When primary healing is complete and the induration has subsided, he will receive a bone graft.) The other indication is the occasional infected fractured mandible in an edentulous patient with non-union where you want to maintain immobilization yet don't want to put anything near the infected site. This patient was edentulous.

DR. MILLER: How would he have been treated had he had teeth?

DR. WOOLHOUSE: After debridement we could have performed simple maxillary wiring.

DR. ROSMAN: How do you fill this gap now? What do you use for grafts? How do you reconstruct the jaw?

DR. WOOLHOUSE: Eventually he will have a piece of full-thickness iliac bone tailored to fill the defect. By conserving the space, insertion of a bone graft is a simple operation, whereas if collapse is allowed to occur, removal of the scar *en bloc* to recover the space is a major procedure.

DR. HILL: How long will it be before you graft him?

DR. WOOLHOUSE: Three weeks to a month, provided there is no infection.

DR. MILLER: May I ask a question the answer to which may shed some light on injuries to bones as well as to other parts of the body? In a dirty, contaminated, open wound of a bone like the tibia, with fragmentation and loss of tissue, the risk of osteomyelitis is exceedingly high. We have repeatedly seen cases of wounds in the mouth (one of the dirtiest of all sites) which communicate freely with fracture sites and where infection does not seem to be a major problem. Could you comment on this low infection rate in cases of compound fracture of the mandible?

DR. WOOLHOUSE: I think the two most likely reasons are that such wounds are usually contaminated with endogenous organisms to which the patient is accustomed. Much more important, however, is the very profuse blood supply to the facial bones and their overlying soft tissues, out of all proportion to what exists in the long bones of the extremities.

Continued from page 186

Decompression of the small intestine by means of a long tube without enterostomy is important in small-bowel obstruction to lower the incidence of peritonitis and sepsis.

5. *Corticosteroids*—This form of therapy, while not of proven value, is widely used. The basis for the large doses used (50 to 150 mg. per kg. of hydrocortisone in a single bolus) is threefold. Firstly, clinical observations suggest benefit in pulmonary and renal function particularly. Secondly, steroids stabilize cellular and subcellular membranes. The most important of the organelles are the lysosomes which may release hydrolytic enzymes that adversely affect the mitochondria to prevent oxygen utilization. Thirdly, corticosteroids stabilize the membranous portion of the microcirculation. A summary of the extensive literature on this subject which generally supports the use of steroids in septic shock appears in a recent monograph.[26]

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